

WHAT IS CLAIMED IS:

1. A method for simultaneous voice and data (SVD) service in mobile communication system, comprising:

performing SVD call processing that supports SVD service between mobile terminals and base stations by using a SVD service option; and

providing SVD service by at least one of transmitting and receiving voice and packet data using a radio link protocol (RLP) frame after service negotiation using the SVD service option is completed.

2. The method of claim 1, wherein said performing SVD call processing by using SVD service option designates and uses a service reference ID for a new SVD service option which is different from a pre-designated voice service option or packet data service option.

3. The method of claim 1, further comprising:

implementing in a media access control (MAC) sub-layer voice RLP module, which assembles a voice frame into RLP frame and fragments, the voice frame from the RLP frame, in order to transmit and receive the voice and packet data by means of RLP frame.

4. The method of claim 1, further comprising:

designating a voice RLP frame type using bit combinations not designated in a frame type field of a data RLP frame, in order to transmit and receive the voice and packet data by means of the RLP frame.

5. The method of claim 1, further comprising:

designating a voice RLP frame type using bit combinations not designated in a control field of a data RLP frame, in order to transmit and receive the voice and packet data by means of the RLP frame.

6. The method of claim 1, wherein said providing SVD service by transmitting and receiving voice and packet data by means of RLP frame comprises:

at least one of transforming a packet data frame into a data RLP frame and transforming a voice frame into voice RLP frame, by using a frame type field or a control field not used in the data RLP frame.

7. The method of claim 6, wherein the voice frame is transformed into the voice RLP frame by using bit combinations not used in the frame type field of the data RLP frame, if the voice frame is a full rate voice frame.

8. The method of claim 7, wherein the voice RLP frame transformed from the full rate voice frame comprises 168 bits of voice frame information, and 3 bits of frame type information indicating which frame type is the voice RLP frame type.

9. The method of claim 6, wherein the voice frame is transformed into the voice RLP frame by using bit combinations not used in the control field of the data RLP frame, if the voice frame is a half rate voice frame or a voice frame under 1/2 rate.
10. The method of claim 9, wherein the data RLP frame used for transforming the half rate voice frame or voice frame under 1/2 rate into the voice RLP frame is one of control frame, fragmented/assembled data frame, fill frame and idle frame.
11. The method of claim 9, wherein the voice RLP frame transformed from the half rate voice frame or voice frame under 1/2 rate is a half or 1/2 rate voice RLP frame, comprising 8 bits and 66 bits of voice frame information and 6 bits of control field information indicating which frame type is a voice RLP frame type.
12. The method of claim 9, wherein the voice RLP frame transformed from the half rate voice frame or voice frame under 1/2 rate is a quarter or 1/4 rate voice RLP frame comprising 8 bits and 26 bits of voice frame information and 6 bits of control field information indicating which frame type is a voice RLP frame type.
13. The method of claim 9, wherein the voice RLP frame transformed from the half rate voice frame or voice frame under 1/2 rate is an eighth or 1/8 rate voice RLP frame comprising 8 bits and 6 bits of voice frame information and 6 bits of control field information indicating which frame type is a voice RLP frame type.

14. A method for simultaneous voice and data (SVD) service in mobile communication system, comprising:

performing SVD call processing that supports SVD service through SVD request signaling message exchange, when SVD service is requested while packet call setup between a mobile terminal and a base station is completed; and

providing SVD service by at least one of transmitting and receiving voice and packet data using a radio link protocol (RLP) frame after service negotiation is completed through the SVD request signaling message exchange.

15. The method of claim 14, further comprising:

implementing in a media access control (MAC) sub-layer voice RLP module, which assembles voice frame into RLP frame and fragments, the voice frame from the RLP frame, in order to transmit and receive the voice and packet data by means of the RLP frame.

16. The method of claim 14, further comprising:

designating voice RLP frame type using bit combinations not designated in a frame type field of a data RLP frame, in order to transmit and receive the voice and packet data by means of the RLP frame.

17. The method of claim 14, further comprising:

designating a voice RLP frame type using bit combinations not designated in a control field of a data RLP frame, in order to transmit and receive the voice and packet data by means of the RLP frame.

18. The method of claim 14, wherein said providing SVD service by transmitting and receiving voice and packet data by means of RLP frame comprises:

at least one of transforming a packet data frame into a data RLP frame and transforming a voice frame into a voice RLP frame, by using a frame type field or a control field not used in the data RLP frame.

19. The method of claim 18, wherein the voice frame is transformed into the voice RLP frame by using bit combinations not used in the frame type field of the data RLP frame, if the voice frame is full rate voice frame.

20. The method of claim 19, wherein the voice RLP frame transformed from the full rate voice frame comprises 168 bits of voice frame information, and 3 bits of frame type information indicating which frame type is the voice RLP frame type.

21. The method of claim 18, wherein the voice frame is transformed into the voice RLP frame by using bit combinations not used in the control field of the data RLP frame, if the voice frame is a half rate voice frame or a voice frame under 1/2 rate.

22. The method of claim 21, wherein the data RLP frame used for transforming the half rate voice frame or voice frame under 1/2 rate into the voice RLP frame is one of control frame, fragmented/assembled data frame, fill frame and idle frame.

23. The method of claim 21, wherein the voice RLP frame transformed from the half rate voice frame or voice frame under 1/2 rate is a half or 1/2 rate voice RLP frame comprising 8 bits and 66 bits of voice frame information and 6 bits of control field information indicating which frame type is a voice RLP frame type.

24. The method of claim 21, wherein the voice RLP frame transformed from the half rate voice frame or voice frame under 1/2 rate is a quarter or 1/4 rate voice RLP frame comprising 8 bits and 26 bits of voice frame information and 6 bits of control field information indicating which frame type is a voice RLP frame type.

25. The method of claim 21, wherein the voice RLP frame transformed from the half rate voice frame or voice frame under 1/2 rate is an eighth or 1/8 rate voice RLP frame comprising 8 bits and 6 bits of voice frame information and 6 bits of control field information indicating which frame type is a voice RLP frame type.

26. A mobile communication apparatus comprising:
- a service interface having a voice radio link protocol (RLP) module and a data RLP module at a MAC sub-layer, configured to transmit and/or receive voice and packet data together by using a RLP frame.
27. The apparatus of claim 26, wherein the data RLP module is configured to perform at least one of fragmentation of a packet data frame in an upper layer and assembly of a packet data frame in the upper layer into the RLP frame.
28. The apparatus of claim 26, the voice RLP module is configured to perform at least one of fragmentation of a voice frame in an upper layer and assembly of the voice frame in an upper layer into the RLP frame.
29. The apparatus of claim 26, wherein voice RLP frames are classified into full rate voice RLP frames, half rate (1/2) rate voice RLP frames, quarter rate (1/4) voice RLP frame and eighth (1/8) rate voice RLP frames.
30. The apparatus of claim 26, wherein the apparatus is at least one mobile terminal and a base station.
31. The apparatus of claim 26, wherein the apparatus is mobile communication system comprising at least one mobile terminal and at least one base station.